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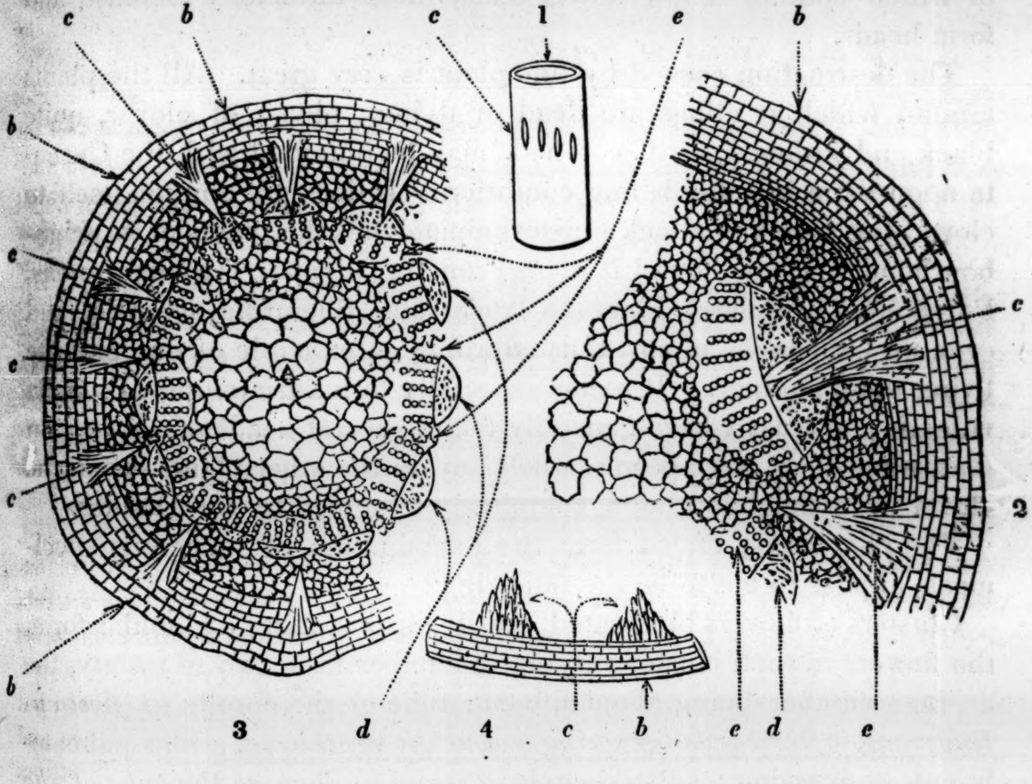
Art. CLXXIII.—*Notes on the new British Cuscuta* (C. Epithymum β. Trifolii, *Bab.*) By Daniel Wheeler, Esq., M.R.C.S.L.



Magnified figures to show the connexion between the Cuscuta and the clover.

Fig. 1.—*a*, portion of clover-stem enlarged. *c*, the apertures by which the Cuscuta penetrated.

Fig. 2.—A highly magnified representation of a very thin transverse section of a portion of the stem of clover, with the Cuscuta attached. *b*, Stem of the Cuscuta. *c*, Spongioles of Cuscuta penetrating the clover-stem; that on the right having a bifid extremity reaches the medullary sheath, that on the left merely enters the cellular tissue. *d*, Bundles of woody fibre. *e*, Medullary sheath.

Fig. 3.—A less magnified representation of a transverse section of a clover-stem, with dodder attached to it. A portion is left unfinished, that the relation of parts may be shown more distinctly. The letters apply to the same parts as in fig. 2.

Fig. 4.—A portion of dodder-stem which has not yet attached itself to clover, magnified to show the shape and cellular structure of the teeth-like processes [spongioles].

Having heard from my friend Mr. Hanson, that the new Cuscuta was growing upon clover in this neighbourhood, I visited the field, and found several patches of it, varying from a few feet to between two and three yards in diameter. Its general appearance cannot be better described than in the words of Professor Henslow. It looks like "fine closely-tangled wet cat-gut carelessly thrown down on the clover;" it is of a pale reddish-brown or yellow colour, of a more robust habit than Cuscuta Epithymum, but not so strong as C. europæa and with fewer heads of flowers; these are bracteated, sessile, white, with a spreading limb to the corolla, and give out a faint, fragrant odour; the stems upon which they are placed are frequently long, round and filiform, occasionally giving off lateral branches, the axils of which contain a few flower-buds, these ultimately increase and form heads.

The destruction caused by this plant is very great. All the plants around which it clings are dead or dying; pieces of clover, quite black and withered, as if scorched, may be obtained with the Cuscuta upon them in a flourishing condition. It does not confine itself to clover, but seems to attack indiscriminately all the plants in its neighbourhood. I have found it upon Prunella vulgaris, Triticum repens, Polygonum aviculare, Plantago lanceolata, Sherardia arvensis, and even on Orobanche minor, thus affording an example of one parasite living upon another. It seems especially to luxuriate upon Prunella vulgaris; at least I have generally found several heads of flowers on that, when there have been scarcely any on the other plants, or on the clover in its neighbourhood, completely strangled by the Dodder.

The characters, drawn from the examination of numerous specimens, appear to me to be the following:—

Clusters of flowers bracteated, sessile, approaching a globular form, the flowers in each cluster varying in number from two to twenty, the average number being about fifteen: tube of the corolla *at first cylindrical, afterwards becoming somewhat ventricose*, scales palmately cut, converging: calyx *nearly or quite as long as the tube of the corolla*, sepals *white*,* ovate-lanceolate, acute.

Being a true parasite, the Cuscuta derives its nourishment from the plants to which it clings, as soon as it has inserted its suckers; and the mode in which this is accomplished is very interesting. The stem has a degree of viscidity readily detected by plunging the hand among a quantity of it; on withdrawing the hand, it will be found that the stems have a tendency to adhere to it, and probably it is this viscidity which at first enables the Cuscuta to attach itself to the clover &c., until it has twined itself round the stem of other plants; this it does by coiling itself round once or twice from left to right, or more frequently it makes several turns and then passes off to another stem, or to a leaf, for I have seen it send its suckers into the leaves of Triticum repens and Plantago lanceolata, as well as those of the clover. If we tear a small piece of the Cuscuta from off the stem of the clover to which it has attached itself, we shall observe some elliptical openings through which the teeth or processes [spongioles] of the Cuscuta have penetrated the structure of the plant, as in fig. 1, *c*. If we make an exceedingly thin transverse section of the clover (fig. 2), with the dodder (*b*) upon it, and place it under the microscope, we shall then observe the dodder sending wedge-shaped processes (*c* in figs. 2, 3, and 4) into the stem of the clover; these processes sometimes penetrate through the layer of woody fibre (*d*) to the medullary sheath (*e*), at other times they can only be traced into the woody fibre, and very often they only enter the cellular tissue. If we examine the long, unattached portions of the stem of the Cuscuta, we may see some of the wedge-shaped processes which have not penetrated any plant; these consist of a number of oblong cells, arranged in the wedge form, their long axis being placed at right angles to that of the dodder, and uncovered by cuticle; they are therefore admirably adapted both to penetrate and to absorb nourishment from the plants they attack.

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* Occasionally tinged with purple.—*Ed.*

I think it probable that the Cuscuta is chiefly nourished by the descending or elaborated sap, having met with many specimens of clover which were more withered below than above; if such be the case, the tight embrace of the dodder would act like a ligature, and thus, by retarding the flow of the descending sap, enable the dodder to obtain a greater supply of nourishment.

I believe there is little doubt that the clover from which I obtained my specimens was raised from foreign seed, therefore there is every probability that the Cuscuta was imported: it is most probably the plant alluded to by Mr. Babington in his 'Manual,' as the var. β. *Trifolii* of Cuscuta Epithymum. DANIEL WHEELER.

Reigate, September 22, 1843.

[Mr. Wheeler's interesting paper was accompanied by recent specimens of the Cuscuta; these are identical with others previously received from Mr. G. S. Gibson, of Saffron Walden, who last year favoured us with a notice of the appearance of this destructive parasite in that neighbourhood, (Phytol. 466). Mr. Gibson has since obligingly forwarded recent specimens: the note which accompanied them will be found among our Varieties. During the past summer a Cuscuta, with a very slender, white stem, made its appearance on young plants of a Cytisus, in the propagating-house of a Nurseryman and Florist, at St. John's Wood: the species could not be ascertained, as the parasite did not flower, but perished after destroying the Cytisus. The following account of the habits and economy of these singular plants, we quote from a provincial paper.—*Ed.*]

"*New Agricultural Pest.*—Professor Henslow last week called attention to the silent but dangerous progress that is making by a new agricultural pest, the clover dodder, which threatens to destroy the clover crop altogether in some places.

"The dodders are a singular race of true parasites, inhabiting all the temperate and warmer parts of the globe, distinguished by botanists into numerous species, but all having the same manner of growth and multiplication. They are leafless annual plants, allied to the bindweeds [Convolvulaceæ], and, like them, strangling whatever they lay hold of. Their flowers, which are small, appear in balls on the stems, speedily form fruit, and end in producing each four seeds, about the size of a grain of mustard, within which is coiled up an embryo plant, looking like a miniature snake. As the number of flowers in each ball is, in our common species, on an average, about fifteen, it follows that every ball will furnish about sixty young plants—whence the rapid spread of such pests may be easily understood.

"As soon as the seed of the Dodder is ripe, it falls to the ground, and usually seems to lie dormant till the succeeding year; sometimes, however, it is said to germinate immediately. When the spring returns, the embryo sends one end down into the earth to form a root, while the other rises upwards, like a small white thread or worm. At this time it is not a parasite, but seems to derive its food from the soil, like ordinary plants. It cannot, however, do so long, but withers and perishes, unless it touches some living branch or stem. If it succeed in doing so, it immediately seizes the live stem by means of a sucker, which is protruded from the point of contact; and then, twining from left to right, and forming more suckers as it twines, it establishes itself on its victim, and ceases to have any further connexion with the soil. From that time forward it is a true parasite, feeding on the juices of the plant it has seized upon. After making a few turns round the branch, and securing itself firmly in its new position, it again lengthens, and catches hold of some other branch, when more suckers are protruded; and thus it goes on — branching, and twining, and sucking, and branching again — until it forms that appearance which Prof. Henslow well describes as resembling 'fine, closely-entangled, wet catgut.' Now the dodder has a new and independent seat of life wherever it has twined round a branch; and as it is incessantly twining and separating, and twining again, a single plant is speedily in the condition of a polype—so that if it be cut into a thousand pieces, each piece will immediately go on growing, as if nothing had happened to it. Tearing the dodder in pieces then, so far from extirpating it, only multiplies the mischief, instead of arresting it.

"This short statement will show that it is a formidable enemy that has thus been unfortunately introduced to our fields; and, as these things are not very nice in their food, it is not impossible that the clover dodder may next take a fancy to our wheat-fields, unless we can speedily put an end to its presence. It is of little use to cut it in pieces—it is of no use whatever to do so, if the fragments are left where they can catch hold of anything else.

"As it is only an annual, it would be killed if we could prevent its flowering; but that is difficult, because of its hiding itself among the lower branches of plants, where it cannot be seen: and a few heads of flowers will soon renew it in a succeeding year. The right plan would be to dig up the clover where the dodder appears, so as to form a circle considerably beyond the patch apparently formed by it, and then to burn it in heaps; or, in cases where the entire field is infected by it, to sacrifice the whole crop, and burn it. This may appear a violent remedy, but it is the only one likely to be effectual; and even this will fail, if (which is not yet the case, but soon will be) the dodder is allowed to form its seeds: for they will fall on the ground, lie hid in the crevices, and reappear with the next crop, — when all the labour will have to be done over again." — *The Ten Towns' Messenger, and General Advertiser: Saturday, September* 23, 1843.

ART. CLXXIV. — *Rarer Plants observed at Weston-super-Mare.*
By G. S. GIBSON, Esq.

I SEND a list of some of the rarer plants noticed at Weston-super-Mare, during a day's visit to that place in the summer of 1843.

Weston is a small but increasing bathing-place, pleasantly situated on the Bristol Channel, about eighteen miles from that city; and possessing considerable diversity of soil and situation, is a locality favourable to the growth of a variety of plants, some of which are peculiar to the vicinity of the sea, and others to hilly or woody districts. Doubtless, in a longer stay, this list might have been considerebly enlarged.

Clematis Vitalba. Hedges.
Papaver Argemone. Cornfields at Uphill.
——— *somniferum*. Waste ground.
Glaucium luteum. On the shore.
Cakile maritima. Sandy shore.
Erysimum cheiranthoides. Waste ground.
Koniga maritima. Ditto.
Reseda alba. Several places upon waste ground, naturalized, but not really wild, and common in gardens.
Helianthemum vulgare, (with white flowers). On the cliff.
Silene maritima. Sandy shore and cliffs.
Arenaria peploides. Sandy shore.
——— *marina*. Cliffs.
Hypericum montanum. On the hills.
——— *Androsæmum*. Sparingly on the cliffs.
Trifolium scabrum. Cornfields and dry banks, common.
Pyrus Aria. Rocks on the hills.
Apium graveolens. Ditches.
Trinia glaberrima. Downs near the signal-post, and at Uphill, near the church.
Petroselinum segetum. Uphill church-yrd.
Helosciadium repens. Marshy ground nr. the railway.
Fœniculum vulgare. Waste ground.
Eryngium maritimum. Sandy shore.
——— *campestre*. Sparingly by the side of a cornfield, by a private road leading up to a house beyond the church: there were only about ten plants. It is, I suppose, a hitherto unobserved locality for this very rare plant, and as such may be interesting to some of your readers.
Rubia peregrina. On the cliffs.
Asperula Cynanchica. Dry banks.
Valeriana rubra. Waste ground.
Cnicus acaulis. On the downs.
Conyza squarrosa. Rocks on the hills.
Aster Tripolium. On the shore.
Convolvulus Soldanella. Sandy shore.
Marrubium vulgare. Waste ground, sparingly.
Plantago maritima, *Glaux maritima*, and *Salsola Kali*. Sandy shore.
Chenopodium murale. Waste ground.
Rumex pulcher. Church-yard at Uphill.
Triglochin maritimum. Shore.
Ophrys apifera. Rocks on the hills.
Carex arenaria, *Ammophila arundinacea*, *Phleum arenarium*, and *Triticum junceum*. Sandy shore.
Triticum loliaceum. Dry road-sides near the sea.

I searched along the shore a considerable time, without success, for Herniaria glabra, which in the 'Botanist's Guide' is said to grow there; and am ready to fear that it has become extinct, if indeed it ever grew there, and if some other plant in an immature state was not mistaken for it. **G. S. Gibson**

Saffron Walden, August, 1843.

Art. CLXXV.—*Rarer Plants found near Ventnor, Isle of Wight.*

By G. S. Gibson, Esq.

The following is a list of some of the rarer plants found in the neighbourhood of Ventnor, Isle of Wight, during a week's stay at that place in the summer of 1843.

Clematis Vitalba. Hedges, abundant.

Papaver hybridum. Cornfields, sparingly.

Glaucium luteum. Sea-shore, plentiful.

Fumaria capreolata. Wayside at St. Lawrence.

Matthiola incana. Chalky cliffs at Steephill, near Ventnor, for some distance, chiefly in inaccessible places, and to all appearance wild.

Cakile maritima. Bonchurch and Shanklin.

Silene maritima. Between St. Lawrence and Niton.

Arenaria peploides. Shore at Shanklin.

——— *marina.* Cliffs nr. St. Lawrence.

Linum angustifolium. Abundant at Shanklin.

Lavatera arborea. Waste ground at Ventnor and Shanklin.

Hypericum montanum. Rare near St. Lawrence.

Geranium rotundifolium. Old walls at St. Lawrence.

——— *columbinum.* On the hills in small quantity.

Euonymus europæus. Hedges at St. Lawrence.

Lathyrus sylvestris. Very abundant in the east end of the undercliff near Bonchurch.

Medicago maculata. Near Bonchurch and St. Lawrence.

Medicago sativa. Near the east end Bonchurch.

Hippocrepis comosa. Near St. Lawrence.

Rosa spinosissima. Near St. Lawrence, scarce.

Epilobium angustifolium. Near Luccombe chine.

Apium graveolens. Shore and cliffs in several places.

Petroselinum segetum. Not uncommon in cornfields, hedges, & waste ground.

Sison Amomum. Hedges, frequent.

Crithmum maritimum. Cliffs at Steephill and other places.

Pastinaca sativa. Road-sides &c. comn.

Torilis infesta. Cornfields, not uncomn.

Smyrnium Olusatrum. Cliffs at Steephill.

Viburnum Lantana. Common in hedges.

Rubia peregrina. Abundant.

Asperula Cynanchica. On the Downs.

Galium tricorne. Cornfields near St. Lawrence.

Fedia dentata. Cornfields.

Cnicus eriophorus. East end, near Bonchurch.

—— *acaulis.* Plentiful on the hills.

Carduus Marianus. Waste ground near St. Lawrence.

Conyza squarrosa. Shady hedges &c.

Pyrethrum Parthenium. Waste ground.

——— *maritimum.* Sea-shore at Steephill &c.

Cichorium Intybus. Fields near St. Lawrence.

Erigeron acris. On rocks at the east end near Bonchurch.

Inula Helenium. Bonchurch, near the east end.

Campanula hybrida. Cornfields near St. Lawrence.

Vinca major. Shady hedge near St. Lawrence well.

Gentiana Amarella. On the downs.

Chlora perfoliata. On the downs and dry hedge-banks.

Erythræa pulchella. Cliffs and dry ground near the sea.

Linaria Cymbalaria. Wall near St. Lawrence well.

—— *spuria*. Waste ground in several places.

Melampyrum arvense. Cornfields by the cliff between Ventnor and St. Lawrence and Niton; and on the rocks of the undercliff near St. Lawrence.

Mentha rotundifolia. Road-side near St. Lawrence, and in some other moist places.

Galeopsis Ladanum. Cornfields &c., frequent.

Orobanche minor.* Clover-field between St. Lawrence and Niton.

——— *barbata*.* At the roots of ivy and grass about St. Lawrence, plentiful.

Statice Armeria. Between St. Lawrence and Niton.

Atriplex laciniata. Shore at Shanklin.

Beta maritima. Near Bonchurch.

Rumex pulcher. Road-sides &c. frequent.

Thesium linophyllum. On the downs in several places.

Urtica pilulifera. Near Luccombe chine.

Orchis pyramidalis. On the downs.

Ophrys apifera. Open sunny banks.

Epipactis latifolia. East end near Bonchurch, very sparingly.

Iris fœtidissima. Hedges & waste ground common.

Tamus communis. Frequent in hedges.

Phalaris canariensis. Waste ground, rare.

Avena fatua. Cornfields.

Hordeum pratense. Near St. Lawrence.

G. S. GIBSON.

Saffron Walden, August, 1843.

ART. CLXXVI.—*Remarks on Botanical Classification.*

By THOMAS EDMONSTON, Esq., jun.

Baltasound, Shetland Islands,
September 25, 1843.

SIR,

The subject of the best mode of botanical classification is undoubtedly one not only of much interest, but of vital importance to the science; and having for some time entertained the opinion that the present system of entirely dispensing with an introductory or "artificial" scheme, is not only wrong in theory, and opposed to the principles of philosophical classification, but almost impracticable in practice; — I have thrown together a few notes on this important topic, in the hope that some botanist will either demonstrate the fallacy of my opinions, or be led to reflect on the incompetence of the "natural" or *fashionable* system to perform all that it promises. With this view the insertion of the following remarks in your valuable journal will oblige, Mr. Editor,

---

* The differences existing between these plants seem to me too slight to constitute them separate species. They both grow in considerable abundance at St. Lawrence, and I could discover very little distinction between specimens of each. May not the trifling distinctions arise from difference of situation and other attendant circumstances?

Yours respectfully,
THOS. EDMONSTON, jun.

To the Editor of 'The Phytologist.'

IT has of late years become a favorite subject with naturalists, and especially with botanists, to cry down as unphilosophical and as unadapted for the extended knowledge and comparatively mature observations of the age, any system of classification which does not include in the definitions of its divisions a great mass of characters, but which assorts the objects of which it treats in groups distinguished from each other by one, or at least by few characteristics. This seems to be the simple difference between the two kinds of classification, the "natural" and the "artificial."

The object of the present remarks is not so much to enter into the more general principles of classification, as to endeavour to demonstrate and illustrate the proposition,—*That a simple artificial scheme is absolutely necessary as an easy introduction to the study of the science, by which a sufficient knowledge of species may be gained to enable the student to turn to the more complicated generalizations of the other system.*

With this view it will tend to give my remarks more precision and individuality, if I take the two best systems constructed according to the principles of the two methods, namely, the Linnæan, almost universally allowed to be the best artificial system, and the modification of Decandolle's system adopted by Professor Lindley in his 'Synopsis,' which appears to be the best and most consistent of the natural methods, and the one in which its principles are seen to the greatest advantage, — as representatives of the respective modes of classification favoured by their authors.

It is a well-known fact, and one often quoted by the advocates of a natural scheme, that Linnæus never intended his sexual system to supersede a natural one, provided that should ever be discovered. But as in the state of the science at the time he lived, and the comparatively limited knowledge of vegetable structure he possessed, it was not only impossible he could frame such a system, but also impossible, had it been done, that the state of botanical knowledge would have allowed of its practical utility; — the object of Linnæus in propounding his artificial system was to furnish botanists with a method of classification, simple and easily acquired, and which would be the great help to gaining the knowledge necessary for constructing and using a natural system: and what was *then* necessary for the state of botanical knowledge *generally*, is, I contend, still indispensible to students *individually*.

To establish this position, it will be well to look first at a few of the general principles and uses of classification as applied to the two rival systems, and then glance at the advantages and imperfections of both.

In the first place, then, as *Nature creates only species*, and as classes, orders, sections, genera, or by whatever names other groupings than specific identity are termed, are merely contrivances for the greater facility of distinguishing and knowing species, I am at a loss to conceive the applicability of the term "natural," as applied to the systems of Jussieu, Decandolle, Lindley, &c.; the appropriation of the term must be either without meaning, or it must proceed upon two hypotheses, both of which, I apprehend, it will be found somewhat difficult to establish, namely, that plants have been created upon a certain plan, and thrown by Nature into classes, orders, genera and species; and secondly, that this scheme of Nature is the same as some one or other of the natural systems: though these hypotheses may doubtless find supporters, I conceive it would be a waste of time to dispute them.

Let us hear Dr. Lindley on the affinities of plants. In his very able 'Key to Botany' (p. 40), he says, — "What we call the characters of plants are merely the signs by which we judge of affinity, and all the groups into which plants are thrown are in one sense artificial, *inasmuch as Nature recognises no such groups.*" *!* What then is a natural system? If no system exists in nature, whence this misnomer? That no such system exists, is abundantly evident, and by Dr. Lindley's own showing too, yet botanists speak of it as a settled thing; and, strange to say, every time such a system is propounded, it is always perfect,—no link is wanting to bind its parts into a harmonious whole, till some new facts or plants are discovered that derange the fair edifice, which has now to be reconstructed only again to be destroyed. The first thing an unassisted student of Botany does, after gaining a knowledge of the rudiments of the science, such as the terminology &c.,

is, to endeavour, by means of descriptions, to ascertain the names of as many plants as possible; I do not mean to say that the name is all he searches for, but that is and must be the first step — it is the root of his knowledge, and without it he cannot proceed one step further. Here he finds the great benefit of classification; instead of having the descriptions jumbled together in a promiscuous heap, he can, by the aid of a good system, soon comparatively isolate the plant he wishes to name, and eventually identify it with some one or other of the species. By this means he begins to know plants, and puts in practice the technical knowledge he was before acquiring. A finished botanist has little or no need of classification. Suppose a botanist knows at once all the plants of Britain, and can tell their distinctions, history and uses; when he arrives at this point the utility of classification ceases; he knows species as species — as separate individuals, and unconnected with their congeners; and though system has been the great means of conducting him to this point, it is no longer of any use to him. And were it possible that in like manner one could be familiar with all the plants on our planet, in the same way would the aids of system be dispensed with; but as this pitch of perfection cannot be attained, and as we are always students—always have more to learn, so we can never lay aside the assistance of classification. Thus it evidently appears that the main use of classification is to assist us in the knowledge of species; classification is the means of acquiring a science,—not the science itself. Let us, by the means of system, learn the name of a plant, we have then many means of gaining the additional information, without which the mere name would be worth nothing. This is, I think, only confining system within its proper limits, without in the least narrowing the sphere of its usefulness. Without enlarging more on this head, which a little reflection will convince any one is and must be correct, let us now glance at the comparative merits of the two systems, as constituting an easy introduction to the knowledge of species.

There never has been a system which is not liable to exceptions; *and when species are classified in more than one set of groups*, this would be nearly impossible, as the different sets of characters used to distinguish the various divisions cannot always be accordant. A system in which the distinguishing characters are limited, is peculiarly liable to this objection; yet notwithstanding the latitude of definition and the vagueness of distinction too common in the characters of natural groups, how many exceptions stare us in the face at the first glance! We should imagine, considering the great outcry which has been raised against the Linnæan system for this imperfection, that Nature's own system would be free from it: — no such thing! We have three grand groups — Dicotyledons, Monocotyledons and Acotyledons—principally characterized, as their names indicate, by having respectively two, one, or no cotyledons; but we have Acotyledonous plants among the Dicotyledons, as Cuscuta and Utricularia: Myrtaceæ is an order of the same class, but some of the species have but one cotyledon. Ceratophyllum and some Cruciferæ and Boragineæ have several seed-leaves, and some Gramineæ, an order of Monocotyledons, have two. This shows that even the primary divisions of the natural system are liable to this objection. Then how many anomalous genera are there shuffled and shifted about from this to that order, until, perchance, there must be a new creation of orders for their reception. Again, look at the *precision* of the characters of the orders. Let us take as an example of this quality the order *Ranunculaceæ*, as it is the first in the list, and quote (what are termed) its distinguishing characters, as they are given in Lindley's 'Synopsis.'

> " *Sepals* 3—6, sometimes confounded with the petals.
>
> " *Petals* 5—15, hypogynous, distinct, occasionally deformed.
>
> " *Stamens* indefinite, hypogynous; anthers usually turned outwards.
>
> " *Carpels* numerous, seated on a torus, one-celled, or partially united into a single many-celled pistil, one or more seeded.
>
> " *Fruit* either consisting of dry achenia; or berries with one or more seeds; or follicles; or capsules.
>
> " *Seeds* albuminous. *Embryo* minute. *Albumen* corneous.
>
> " *Herbs* or very rarely *shrubs*. *Leaves* alternate or opposite — generally divided, with the petiole dilated and forming a sheath half clasping the stem. *Inflorescence* variable."—Synopsis of the British Flora, ed. 2, p. 7.

Is there a single definite character here? In the first place there may be either a perigone or the calyx and corolla blended together, as in Anemone, or a distinct calyx and corolla, as in Ranunculus; nay, in some species of Clematis the corolla is altogether wanting. The corolla may be regular or irregular, as in Ranunculus and Aconitum. The stamens are indefinite; the anthers introrse in Actæa and Pæonia, extrorse in the rest of the genera. The carpels may be distinct, as in Ranunculus &c., or form a compound pistil, as in Actæa. The seeds may be solitary or numerous; the fruit may be almost anything—pseudospermous, baccate, follicular or capsular. Finally, concerning external characters and general appearance, the plants belonging to this order may be herbaceous or suffruticose; the leaves may be simple or compound; and the inflorescence is like almost all the rest—" variable."

These characters are something like those employed by the French ornithologist, M. Vieillot, in defining his order *Grallatores.* "Feet moderate or long, robust, or slender. Legs half bare; toes slit or webbed, sometimes margined, two before only—three before only—or three before and one behind; pollex raised from the ground, or resting upon it only by the tip, or reposing upon it in its whole length; claws of various forms, not retractile; bill of various shapes." !! So much for a definite arrangement in Ornithology; this is also termed a "natural" system.

My object in bringing forward these instances is neither to undervalue the ability of the eminent authors of these systems, nor the utility of well-constructed natural systems in their proper place; but merely to show the very vague definitions which have crept into our modern classification, and the strange passages sometimes written when authors are determined to see nothing but some shadowy abstraction, which cannot be reduced to practice.

I cannot understand what is sometimes meant by the term, a "natural group." It is said to be a group whose individuals agree in the greatest number of points; and moreover, botanists will tell us that there is always a general resemblance among the members of a natural group (as indeed there must be if they are alike in the majority of their characteristics); now Myosurus has but little resemblance to Ranunculus or Aconitum, and yet they all belong to Ranunculaceæ: nor is Adoxa much like the ivy, yet both are classed in Araliaceæ. And if we examine the characters in detail, we shall find them as dissimilar as the general appearance; in fact, "natural" resemblances have often no existence but in fancy. In such divisions as Compositæ, Cruciferæ, Gramineæ, Malvaceæ, Leguminosæ, Labiatæ, &c., the species of which are very nearly allied, the general resemblance is doubtless striking; but let us not forget that these most generally belong to Linnæan classes, only differing in name from those of the natural scheme.

Notwithstanding Decandolle's advocacy of the Linnæan axiom—"Genus dabit characterem, sed non character genus," — it is chiefly his losing sight of this principle, which, though it may sometimes be carried too far, is generally an admirable rule, that has occasioned the introduction into his system of so many vague and useless characters. What Linnæus applies to genera, is equally applicable to natural orders; but instead of endeavouring to find a common character or characters for the group to be established, it would almost seem, in some instances, as if a description were written, a number of plants thrown together under it, and when some of them did not agree with the definition, exception after exception were interlined, until a great part of it looks something very like nonsense.

It appears to me impossible that when the same characters are employed to designate classes, orders, genera and species, that a distinct definition can ever be established. It is undeniable that certain characters are of ordinal, others of generic, and others again only of specific importance; and characters which in some plants may be used for the primary divisions, in others can only be employed for species. Experience alone is the test of this; and in consequence of this fluctuating importance of characteristic marks, it is impossible strictly to set apart such and such characters for such and such divisions; despite this fact, however, it is well known that there may be certain rules laid down which may very generally be followed, subject to some exceptions. And the tendency towards always employing the same marks of distinction for all groups, most inevitably leads to confusion and anarchy in any science. When it is borne in mind that all the divisions are in every case arbitrary, and when one character cannot be obtained another must be sought for—the cause of this difference of importance will be at once apparent. Enough however on this head. As it has been proved that all the divisions of botanists, under the names of classes, groups, alliances, orders, genera, sections &c. have no existence in nature, it of course follows that any system has for its only ground of utility the facilitating of the knowledge of species; thus in one view all systems are alike artificial, and the only test whereby to know which is the best, is to be found in their *practical utility*.

I object to the "natural" system as the best means of acquiring a knowledge of species, for the following out of many reasons:—

1. Because in this kind of system the principle of contrast or diagnosis is not sufficiently kept in view. A definition or specific character ought to embrace nothing but those points which distinguish the group it is defining from all others: instead of this being the case, the natural school substitutes cumbersome descriptions, containing little definite matter, in which differential characteristics are buried.

2. These differential characters themselves are often injudiciously chosen. This is especially apparent when some rather obscure and not easily discernible characters, derived from the structure of the ovules and seed, are employed to distinguish principal groupings. It is a rule that the characters of primary divisions ought always, when practicable, to be taken from some parts of the plant *easily seen*, or

at least not requiring such delicate microscopical investigation as the natural system often requires. The seed is, in my opinion, altogether too much used in the definitions of the natural school; all the analyses of natural orders are founded on the structure of this organ, and a student must be not only intimately acquainted with the variations of the seed—in itself a difficult branch—but must also have the facilities and knowledge necessary for extensive microscopic investigation, almost before he can cross the external boundaries. Has every student the apparatus necessary for this object? And is not the necessity for it likely to perplex and disgust the student?

3. The divisions are too much multiplied, and the differences between them often too nice. Many instances of this might be brought forward, for which we have not space at present. At all events a too great multiplicity of subordinate divisions must perplex the beginner, and throw unnecessary difficulties in his way.

These are some of the reasons which induce me to think that the "natural" system is not the one suited for initiating beginners into the science; and I shall now shortly mention a few of the principal reasons why the Linnæan system appears to me preferable for this object.

No one attempts to deny the facility with which the Linnæan system is acquired, and the great simplicity of its structure as compared with the other method; and the only controversy between the advocates of it and those of the natural scheme, is as to which is the easiest and most profitable in practice.

The points in which the Linnæan seems to me to surpass the natural method, are the following: —

There is nothing superfluous in the characters of the main groups: a distinct definition is established, and no diffuse details are allowed to interfere with the precision of this definition. By reason of this we at once come to the essential part of the character, and have no trouble to hunt it out from among a number of common characters. Again, these characters are drawn from parts of the plant very important in themselves, not liable to vary, and easily and at once recognized; the primary divisions are comparatively few in number, and for the most part, in the same ratio the difficulty of ascertaining any plant we wish to know is diminished. And finally, a very great degree of precision is unquestionably attained, by the employment of different characteristics to define different groups.

The objections sometimes urged against the Linnæan system, appear to me strangely unfounded. On this head Dr. Lindley has the following remarks. "The student must be acquainted with the meaning of many technical terms; he must have his plant in different states of growth; he must procure the fruit; he must examine the interior of that part: in short he must go through a long and careful examination, which is entirely independent of the sexual system." Now if the sexual system set out with teaching Botany by intuition, so to speak, and dispensing with either the knowledge of technical terms or the examination of the parts of the plant, this criticism might be just; but as it does not lay claim to these properties, I am at a loss to conceive its applicability. At the same time with the above, Dr. Lindley goes on to say, "Now I distinctly assert that there is no difficulty in determining the natural orders of plants greater than that of making out the genera by the Linnæan system; in fact it is the very same thing, only with a different result: in the one case it leads to the mere discovery of a name, in the other to the knowledge of a great number of useful and interesting facts, independent of the name." Now if it be the case that the student must go through the same process—examine the same parts—in the one as in the other system, it will be singular if the amount of knowledge gained is not equal. In fact the examination necessary for the knowing the genus and species of a plant, after you have got at its class and order by the Linnæan system, gives as great an amount of information concerning the plant itself, as if this end were attained by the natural system, with this difference, that the information is far more easily acquired, and the process not nearly so complicated.

Botanists of the natural school thus blame the Linnæan system for compelling the student to examine the plant, which examination is the means of his gaining the great amount of information the natural system undertakes to teach, and then assert that the Linnæan student gains nothing but a name!! It is a favourite theme of animadversion on the illustrious Swede and his followers, that their system teaches nothing but names, and deals more in dry distinctions than in facts which lead to our more perfect knowledge of the subject: we will not retort on such critics that useless verbosities and aimless speculations constitute the main foundations of *their* system. That the beautiful precision introduced into a previously chaotic science by the master mind of Linnæus, had, when it fell into the hands of men of contracted minds, the effect of limiting the science more to the study of distinctions and of names than of facts and history, is not to be denied: but this is not the legitimate result of the Linnæan system;

and its perversion, by men incapable of appreciating or using it, does not militate against the scheme itself.

In opposition to the experience of Professor Lindley, who "was driven to seek refuge in the natural system from the difficulties and inconsistencies of the Linnæan," we could proudly point to names the greatest in the annals of the science, who trode in the steps of the Upsal Professor, — to Thunberg and Solander, to Banks and Woodward, to Smith and Hooker, and hundreds of others, both in this and every other country, who, under the banner of Linnæus, have been the principal means of raising Botany to her present station among the sciences.

The above are a few brief and meager notes on a very important and fruitful theme, and one on which I could have wished to enlarge more than my limits would permit. I hope, at no very distant period, again to recur to it in another form, when my reasons for entertaining the views here expressed will be more fully illustrated; but in the mean time if these remarks can only induce botanists to examine the merits of the two systems carefully and impartially for themselves, I am persuaded they will, in most instances, come to the same conclusion that I have done. THOS. EDMONSTON, JUN.

ART. CLXXVII. — *Notice of a new British Calamintha, discovered in the Isle of Wight.* By WM. ARNOLD BROMFIELD, Esq., M.D.

I HAVE great pleasure in announcing, through your pages, the discovery by myself, on the 29th of August last, of a Calamintha, which will probably prove to be the true C. officinalis of the continental botanists, and is now in full flower. It is in a beautiful and picturesquely wooded valley between Apes down and Rowledge, about three miles and a half from Newport towards Yarmouth in this island, that this fine addition to the Labiatæ of Britain grows in the greatest profusion and luxuriance, and I have no doubt as truly indigenous as the common Origanum vulgare and Clinopodium that accompany it, and which it even surpasses in abundance. Leaving Newport by the lower or southern Yarmouth road through Carisbrooke and Calbourne, and a little before arriving at Swainston, the seat of my friend Sir Richard Simeon, Bart., on whose estate the plant grows, you come to a farm house (Apes down) by the road side, and situated at the northern termination of the valley alluded to. Nearly opposite this farm, on the other side of the road, is a low meadow, in which Cyperus longus may be found growing pretty plentifully, and flowering at the close of August and throughout September, if spared by the scythe, but it is neither so luxuriant nor so abundant as in another station near Niton, at the back of the island. Passing through the farm-yard at Apes down, a road conducts to Rowledge, at the upper end of the valley, the sloping sides of which are clothed with thick woods interrupted by bands or strips of down, whilst the centre is occupied by corn-fields; the soil is of a chalky nature, and full of loose angular stones. In these woods, on the right or western side of the valley, ascending from Apes down, the Calamintha may be found, growing amongst the long herbage and under the shade of the bushes, in vast quantity, for a great part of the way towards the head of the vale, scattered over the hill-side copses wherever there is shade and shelter sufficient, but, unlike our common species of Calamintha, always avoiding open and exposed situations, or where there is not plenty of herbage and undergrowth, in which respects it resembles Melittis Melissophyllum, a plant which, though frequent immediately on crossing the Solent to the main land of Hampshire, I have hitherto been unable to detect in the Isle of Wight.

Our Calamintha is a highly beautiful plant, with flowers of a fine pale rose colour, spotted with purple or even blood-red: the corolla is nearly an inch long, and three times the length of the calyx. Besides the vastly larger size of the flowers and leaves, which last are of a brighter green (pointed and much more closely and acutely serrated) than in the usual form of C. officinalis; the whole plant is taller, more slender and much less branched: the stems are lax, ascending or reclining: the cymes (cymose verticils) fewer flowered; the calyx coloured (purple), the teeth of the upper lip strongly recurved: the lower lip of the corolla is very broad, its lobes rounded, the middle one but little exceeding the two lateral ones in length, and separated from them by a very narrow and shallow emargination, hence appearing almost as one undivided lobe. Calamintha officinalis is well known as a native of rocky and shady subalpine woods in Switzerland, Carniola, and other parts of the South of Europe, and may well be found with us at a less considerable elevation, being probably one of those plants that, like Tamus communis, Briza minor, Gastridium lendigerum, and other species common here, have a tendency to migrate in a northwesterly direction towards their vanishing point.* No one who has seen our Calamintha in the sequestered woods about Rowledge, can, I think, hesitate to pronounce it truly wild with us; and I trust this notice of its discovery in the Isle of Wight, will, ere long, lead to its detection in other parts of the kingdom. The flowering period, like that of our commoner species (likewise found in this island), appears to be August and September, perhaps continued into October.

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* This is remarkably the case with the Irish Ericaceæ — Arbutus Unedo, Erica

Care must be taken, as I have before mentioned (Phytol. 131), not to confound Apes down with Apse farm and Apse castle, between Shanklin and Newchurch; the latter probably had its designation from aspen trees, which in Vectian vernacular language are called *apse*.

Wm. Arnold Bromfield.

Ryde, September 1, 1843.

Art. CLXXVIII.—*Varieties.*

380. *Note on the new Cuscuta.* I enclose some specimens of the Cuscuta, gathered yesterday in a field of Sir J. M. Adam's near Thaxted, where it has destroyed a considerable quantity of clover, growing in circular patches of from four to twelve feet in diameter, killing the clover in the centre, and then spreading round to an indefinite extent. It does not appear quite to agree with Babington's description, the limb of the corolla being spreading, as in C. Epithymum, of which, perhaps, it will only prove a variety. — *G. S. Gibson; Saffron Walden, August* 24, 1843.

381. *Note on Isnardia palustris.* I may mention that I collected, the last week in August, Isnardia palustris in reasonable abundance, in Mr. Borrer's new station at Brockenhurst, though not in flower: the locality brings this rare species within a few miles of our Isle of Wight shores.—*Wm. Arnold Bromfield; Ryde, September* 1, 1843.

382. *The least troublesome method of drying Plants for the Herbarium.* That the art of drying plants is very little understood by the collecting botanists of this country, is but too well shown by the wretched specimens sent to the Botanical Societies for distribution. Yet nothing is more easy than the making of good specimens, by botanists who have the opportunity of drying plants at home, or at any fixed locality. I have tried various processes, in order to ascertain

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mediterranea and Menziesia polifolia, whose chief seat is in the Pyrenees and mountains of the Asturias in Spain. I find that Calamintha grandiflora occurs in Belgium, according to Lejeune, Fl. de Sp. 2me part. p. 33.

which is the *least troublesome,* consistently with a *good condition* of the specimens when dried, and have at last settled into the custom of putting *an ample quantity of porous paper between the layers of specimens, and not changing it until the specimens have become sufficiently dry to be taken out of press.* Frequent changing of paper, artificial application of heat, previous immersion in boiling water, and other recommended processes, may be very useful in the preservation of particular species; but they must unavoidably increase the personal trouble, and consume the time of the botanist; and that, too, without equivalent advantage in the case of at least ninety in the hundred of our native species. Some practice is requisite to apportion the pressure to the resistance of the paper and plants, and on the success of this will materially depend the beauty of the specimens. If too little pressure be applied, the specimens shrivel, and remain inconveniently brittle. If too much pressure be used, the structure of parts is rendered less fit for after examination, and the colours are destroyed. The quantity of paper to be introduced between the layers of specimens, will vary according to the nature of the plants and the thickness of the paper itself. In my own practice it ranges from half a quire to many quires of demy grey, common blotting-paper, or thick filtering-paper: grasses and ferns, for example, requiring much less paper than do the lilies and Chenopodiums. The more common faults with botanists, are those of giving too little pressure, and using too small a quantity of paper; so that their specimens are both fragile and bad-coloured. Heavier pressure would prevent fragility,—more paper would preserve the colours. I do not recommend my own custom as being productive of superexcellent specimens, but as productive of sufficiently good specimens at the smallest cost of time and trouble to the botanist. And I cannot hesitate to add, after seeing the specimens of scores of other botanists, that those dried by my simple and time-saving process, are considerably above the average in quality, as regards both the preservation of colour, and fitness for fastening on white paper. In illustration, I have used the freedom to address to the Editor, a packet of specimens dried in 1841 and 1843, without any change of papers. They will show that the colours of the Orchis, primrose, cowslip, many blue flowers, and other plants which usually fail in this respect, may be well enough preserved without any greater trouble than that of putting the plants into paper when fresh, and taking them out when dried.—*Hewett C. Watson; Thames Ditton, September* 15, 1843.

[The beautiful condition of the plants kindly forwarded by Mr. Watson, fully proves, what indeed we never doubted, the perfect adaptation of his plan to the preservation of botanical specimens. Unfortunately, however, it is only when stationary, either at home or in some fixed locality, that the botanist can avail himself of this method, unless he travel with a horse and cart, and a shop-full of paper, as we believe some of the Edinburgh parties are in the habit of doing in their summer excursions. The poor pedestrian, with his comparatively scanty stock of paper strapped over his shoulders, must dry it whenever he can find an opportunity of doing so; and these opportunities, as we have known to our sorrow, are often "few and far between," and sometimes do not occur until the plants collected on previous days are, so far as their *beauty* is concerned, completely spoiled. Among the specimens sent by Mr. Watson, the whole of which are excellent, we were particularly pleased with the following:—Linum angustifolium, Cerasus avium and austera, Orchis mascula, Euphorbia amygdaloides (a splendid specimen), and several Primulas, with the colour of the flower in all, except the Bardfield P. elatior, most beautifully preserved. Many of the plants sent were raised from seeds collected in the Azores; several of these, as Arthrolobium ebracteatum, Polycarpon tetraphyllum and Lotus angustissimus, appear to be identical with British species. We can specify no more than the above very small number of the *good things* contained in Mr. Watson's packet, for which we beg him to accept our best thanks.—*Ed.*]

383. *Shetland locality for Cynosurus echinatus.* It will perhaps interest the readers of 'The Phytologist,' to know that I have this year re-found Cynosurus echinatus in Bressa, Shetland, about a hundred yards from where I found it in 1840. I obtained only three rather small specimens; but this fact proves the perseverance of the plant in the locality, and shows the propriety of reckoning it in the Scottish Flora. If such a request be not considered presumptuous, might I mention, through the medium of your pages, that if any of your correspondents could furnish me with even the *loan* of a *South of England* specimen of C. echinatus, it would be conferring a great obligation on me. The Shetland specimens, both those collected at first and also now, differ much from my foreign specimens; the latter are admirably and characteristically figured in Parnell's beautiful 'Grasses of Scotland.' They differ from the Shetland form in having a much more *dense roundish* spike, which is covered with a somewhat hoary pubescence, totally absent from the Shetland specimens. I should much like to see an English specimen of this interesting grass, to ascertain which form my plant agrees with. — *Thos. Edmonston, jun.; Baltasound, Shetland, September*, 1843.

[Among the plants mentioned in the following communication by Mr. Gibson, as having been collected by himself in the Vale of Calder, is Cynosurus echinatus. We have no doubt that Mr. Gibson will feel pleasure in complying with Mr. Edmonston's request; we also should be much gratified by the receipt of a specimen from each of the localities discovered by these gentlemen.—*Ed.*]

384. *Plants observed in the Vale of Calder*. Yesterday afternoon I had a ramble in the vale of the Calder, between Brighouse and Sowerby bridge, a distance of about five miles. The following is a list of the rarer plants which I gathered; if you think it will be interesting to any of your readers, it is at your service. Lolium temulentum, arvense and multiflorum;—the last plant I found with from two to sixteen flowers. Bromus secalinus, var. *stricta;* the spikelets of this plant are always upright, not drooping, as in the common state. Bromus arvensis; this I found in three different places; it appears to be not very uncommon in that part. Cynosurus echinatus, Myosotis collina, Erysimum cheiranthoides, and Asperula arvensis. — *Samuel Gibson; Hebden Bridge, September* 21, 1843.

385. *Description of Aspidium recurvum.** The announcement of a new edition of your 'British Ferns' induces me to trouble you with a remark, for which you may perhaps find room in 'The Phytologist.' In the 4th vol. of the 'Magazine of Natural History,' under the head of "List of Rare Plants found in the neighbourhood of Penzance" (p. 162), I mentioned, among other things, Aspidium dilatatum, var. *recurvum*, not knowing how else to designate what I believed to be an undescribed British fern; and in a note at the foot of the page I expressed an opinion to that effect. Since the publication of that list, the fern has been noticed by several botanists, and recorded by yourself as a variety of dilatatum. I am perfectly aware that dilatatum is a most variable species, assuming as it does very different appearances according to soil, situation, shade, moisture, &c. Recurvum is equally given (if I may so say) to "ring the changes" on variety, but to a practised eye it is in all its forms readily distinguishable from every form of dilatatum. And I now beg to say, that after close observation of the fern in the neighbourhood of Penzance in the year 1817, and on the Irish mountains some years previously, as well as from an intimate acquaintance with the plant in a cultivated state from that time to the present, I am confirmed in my original opinion, that the fern in question is a species distinct from dilatatum; and as such I hope to see it noticed in your forthcoming new edition of 'British Ferns.' I may add, that in the above opinion I am borne out by that of the late Mr. James Dickson—no mean authority on such a subject—and by that of Mr. Drummond, formerly curator of the Cork garden. I believe this curled fern is sometimes known among botanists by the name of Aspidium spinulosum; and, for all I know to the con-

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* In a letter to E. Newman.

trary, it may be identical with the spinulosum of *continental* writers; but on that point I do not mean to express any opinion, being quite ignorant what the A. spinulosum of the continent is. But the fact is worth recording, and it may save botanists some trouble and perplexity to state, that the application of the specific name of spinulosum to a *British* fern—(first adopted, I believe, by Smith and Sowerby in 'English Botany') originated in error; the fern so named and figured in 'English Botany' being nothing more than a young or starved specimen of A. dilatatum, as I was informed many years ago by Mr. Mackay, who supplied the very specimen described and figured in that work. The fern called spinulosum by the late James Dickson, is quite different from recurvum, and is, I believe, generally considered as a small variety of dilatatum, although from the large form of the latter species it appears, at first sight, to be abundantly distinct, and ought, I think, to be so regarded. I admit, however, that there do occur intermediate forms or varieties — "connecting links" they may be called — which, if dilatatum and spinulosum (Dickson) are regarded as *two species*, render it extremely difficult to draw the line of demarcation between them, and to say where the one ends and the other begins.— *W. T. Bree; Allesley Rectory, September* 19, 1843.

386. *Locality for Epimedium alpinum near Bristol.* About fourteen years ago, when in company with other gentlemen on a botanizing excursion, I gathered Epimedium alpinum in Leigh wood, near Bristol. At the time I made no note of the exact spot where the plant grew, and circumstances removed me from Bristol soon afterwards, when the pursuit of the science was interrupted for a long interval; but it was in the northern division of the wood, belonging to P. J. Miles, Esq., that the plants were found. Leigh wood is there coppice, which is cut in portions in rotation; and it is probable exposure to sun and air may have destroyed the Epimedium for a time, and that it will re-appear as the coppice again grows and affords suitable shade. Since the period before mentioned I have not gathered a single specimen, but as the wood is a large tract, I may not have investigated the spot where the plant was originally found. A specimen gathered by myself is extant in the herbarium of G. Rogers, Esq., of Bristol. I cannot guess how the Epimedium was introduced into Leigh wood, which is natural coppice; yet Mr. Babington considers the plant to have but slender claims to be ranked as a native. Be this as it may, the present is the most southern habitat for this interesting plant, which has, up to this time, been considered as entirely

confined to the northern counties.—*Henry Oxley Stephens*; *78, Old Market St., Bristol, September* 29, 1843.

387. *Note on the Weymouth locality of Vicia lævigata.* In reference to Mr. G. S. Gibson's list of the rarer plants observed by him at Weymouth during the present year (Phytol. 735), I beg leave to state that I was staying at Weymouth for a month in the autumn of the year 1837, and that I then most carefully examined the coast and Chesil bank for miles, in search of Vicia lævigata, but was wholly unsuccessful. I am perfectly satisfied that it does not now exist in that locality. I found most of the plants mentioned in Mr. Gibson's list, and also Vicia bithynica in hedges on the east side of the Backwater, but sparingly. Lathyrus Nissolia, Polycarpon tetraphyllum &c. were not found by me.—*A. Bloxam; Twycross, October*, 1843.

388. *Surrey localities for Linaria spartea and Senebiera didyma.* About a month ago I observed numerous plants of Linaria spartea extending over a space of four hundred square yards, in a stubble field opposite the Walton station-house, on the south-western railway. Though the plants had been cut down with the corn, many of them still produced flowering-branches from the lower part of the stems, and five hundred specimens might have been collected. This ground was part of Walton heath before the formation of the railway, but has since been inclosed and brought under cultivation. I had not previously been on the exact spot where the Linaria was found, although I had crossed the heath on different occasions while the railway was in progress, without having observed any specimens of the plant; and I should deem it highly probable that the seeds had been introduced by some means within the last three or four years. Senebiera didyma was found at West end, near Esher, by the side of the road which runs from Esher bridge to the Portsmouth road, on Winter downs; there were a score or two plants of it, on a spot where I had seen garden refuse thrown a few years ago, and where I feel very confident the plant in question did not grow before the year 1840. Both these species are likely enough to maintain their ground by seed, and on this account it appears desirable to put on record their appearance (probably quite recent) in these localities. Three plants of the garden form of Hyoscyamus niger (?) with a clear yellow flower, destitute of black lines, were growing with the Senebiera. I should add that the Linaria is the ornamental plant cultivated in gardens under the name of Antirrhinum sparteum; but whether or not it is also identical with A. junceum, I cannot say with certainty.—*Hewett C. Watson; Thames Ditton, October*, 3, 1843.

389. *Succession Buds in the axilla of a single leaf.* In making a reference to a late No. of 'The Phytologist,' my eye rested accidentally upon Mr. W. Wilson's note on the axillary buds of the common locust-tree (Phytol. 613). There is no express statement in that note whether it was the plurality or the concealment of the buds that was deemed deserving of particular record; but the language and note of admiration ("when lo! instead of a solitary bud, no less than three were contained in the hollow base of each petiole") would seem to imply the former. Several garden plants produce a succession of buds from the axilla of the same leaf. Some of the Fuchsias, for example, first produce a flower-bud from the axilla, and afterwards a leaf-bud developes into a shoot immediately above the peduncle of a flower; and above the base of this young shoot, in turn, the rudiment of another branch or leaf-bud may be observed. So, also, two buds are produced for successive development into branches, at the axilla of a single leaf of Lophospermum erubescens. In the vine, two buds are produced, side by side, in the axilla of a leaf; one of them being commonly, though not invariably, developed into a shoot the first year. As in the case of the locust-tree, the vine also rapidly produces a second shoot from the same part of the stem, after its first shoots have been killed by spring frosts; but perhaps this occurs only at those places where both the buds have remained dormant until the second year.—*Id.; October* 17, 1843.

390. *Leaf-buds produced from Roots.* While on the subject of buds, I may add a note on a statement made in Dr. Lindley's 'Introduction to Botany,' p. 51. It is curious to find, in a work so generally accurate, the statement of "roots being essentially characterized by the absence of buds." Yet it is a very common occurrence for shoots or suckers to be produced from the roots of trees, many yards distant from their stems, and connected with the stems only through the roots from which they grow. In the roots of poplars, common horse-radish, and many other trees and herbs, the tendency to produce suckers is so strong, that they may be rapidly multiplied by cutting their roots into short lengths, which produce suckers and become distinct plants. No doubt suckers are frequently nothing but shoots from the base of the stem, which run some distance underground; but in the cases above mentioned, the sucker grows directly from the true root. Such suckers are buds developed into shoots under ground. I should, however, observe that in another part of the same work, the author in some degree contradicts his first statement, while repeating it; namely, "a root has no leaf-buds, unless indeed, as is sometimes the case,

it has the power of forming adventitious ones." It seems to me, that we might just as correctly apply the term "adventitious" to the runners of a strawberry, as to the suckers from the roots of a poplar: the runner and the sucker are ordinary and natural modes of propagation. —*Id.*

391. *Note on Carex distans.* I trust you will allow me to assure Mr. Wilson, that when I make any enquiry, *it is for the purpose of gaining information,* (Phytol. 746). I do know that the stalk (*scapus*) is that part of a plant which elevates and supports the flower; and I should expect that by the words "barren stalk" is meant that part of the stem which lies between the uppermost fertile spike and the bottom of the barren one; but after allowing this, I am at a loss to know what is to be understood by the sheathing bracteas of these stalks. I am also at a loss to know the meaning of remodelling the specific characters of our Carices; for if they have been once accurately described, I see no occasion for their characters being remodelled: but it appears to me that Mr. Wilson has always found himself at fault in making out the difference between Carex distans and C. binervis (see 'British Flora,' ed. 1, p. 396, and ed. 5, p. 430). I do not pretend to have any superior skill in discriminating our Carices, but I will say that Carex distans may always be known from C. binervis by the form of the nut; as see Mr. Leighton's *very correct* outline figures of that part. If I were to remodel the description of C. distans, it would stand as follows. I should first place it in a section with C. flava and pulla. I make this arrangement, because the stigmas in these three plants are so variable, C. pulla having from two to three, flava from two to four, and distans from three to five. CAREX *distans.* I.—Barren spike solitary, with obtuse scales. Fertile spikes from two to four (rarely five), erect, with the peduncles inclosed about half way up by the sheathing bases of the foliaceous bracteas; ligula opposite the leaves, blunt. Perigynium oval, suddenly contracted and forming a narrow bifid beak, which is often toothed on its edges, ribbed, ribs equal, seven on each side, two on the margins: nut oblong, elliptical, *equally attenuated at each end,* the number of angles is from three to five, depending on the number of stigmas. This will be found somewhat at variance with Mr. Babington's description of C. distans, the reason of which is that Mr. Babington has referred a plant to that species which I consider distinct. It differs from C. distans in having its perigynium much larger and much less distinctly ribbed, and not suddenly contracted, but regularly tapering to the bifid point. The glumes of the fertile spikes in this plant are only about half the

length of the perigynium: the fertile spikes are much shorter than in C. distans, and their peduncles quite inclosed in the sheaths of their bracteas. This form grows inland on dry ground, as at Jackdaw crags, near Tadcaster, &c. Perhaps it will be said by some that the occurrence of four stigmas in Carex distans is accidental; in reply to this I would say that to me it appears not to be accidental, since I have the plant from several localities, in three different counties, and all the specimens have more or less of the perigynia in every one of the fertile spikes possessing four stigmas; though it has been stated by a person who thinks himself no tyro among the Carices, that such a thing could not be in *nature*, as a Carex with four stigmas and a four-angled nut. The specimen I now inclose is from Wallazey pool, Cheshire; perhaps you will tell your readers how many stigmas it has.* I will conclude this note by saying, in reply to Mr. Wilson, that the passage alluded to (Phytol. 680) is somewhat obscure to me; and as I know nothing of any *fountain-head*, I shall feel obliged by an explanation.—*Samuel Gibson; Hebden Bridge, October*, 1843.

392. *Note on a new British Carex.* While on the subject of Carices, perhaps I may be allowed to offer some remarks on a few other species of that genus. The first I wish to notice is the plant which I mentioned some time ago (Phytol. 366), as a form of C. teretiuscula, with fruit as in paniculata. In August, 1842, this plant was given to me for Carex teretiuscula; in June, 1843, I had the same plant sent from Manchester under the name of C. paradoxa: since that time I have examined the plant with great care, and my opinion now is that it is not a state of either of those species. For my own convenience I propose the following name: — CAREX *Pseudo-paradoxa.* Spikes panicled, branches approximate: perigynium ovate, gibbous, acuminated into a serrulate bidentate beak, more or less plano-convex, with seven nerves on the convex side (three very slender in the middle and two strong ones on each side of them), the outer nerves, or those nearest the margins, being very short; nut rhomboidal, narrowing from below the middle; style enlarged at the base: stem three-angled, angles rough on the upper part: leaves narrow, rough on their edges. This plant differs from C. teretiuscula in having its spike more distinctly panicled, in its nut being narrowed upwards from be-

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* On examination of the specimen above alluded to, we find that many of the fertile florets have four stigmas, as Mr. Gibson has correctly observed. We have taken the liberty of omitting some remarks on the fifth edition of the 'British Flora,' since they are scarcely relevant to the question under consideration.—*Ed.*

low the middle, and in its style being thickened at the base: in C. teretiuscula the style is not thickened at the base, and the nut is pyriform, narrowing downwards from above the middle. This plant grows in the neighbourhood of Manchester, but I am sorry to say I cannot give the exact locality, *as that is a secret*. The same plant grows plentifully by the sides of Malham tarn, near Settle, in Yorkshire. It is nearly allied to C. paradoxa, which grows in Islington fields, near York, and is accurately described by Mr. Babington in his 'Manual,' (p. 337). C. paradoxa may at once be distinguished from this plant by its perigynium, which is more gibbous, and has about nine nerves on the convex side and seven on the other.—*Id.*

393. *Note on Carex boenninghausiana and C. axillaris.* The next I would notice are Carex axillaris and C. boenninghausiana; see Babington's 'Manual' (p. 339), Mr. Luxford's note (Phytol. 650), and Mr. Edmonston's list of Edinburgh plants (Id. 407 and 522). This will, I think, be some excuse for my enquiry (Phytol. 263); and perhaps, after all, C. axillaris may turn out to be a much rarer plant than was suspected. The following short description I drew up from one of the specimens referred to by Mr. Luxford, while in my possession; since that time Mr. Luxford has been kind enough to give me one of those specimens. CAREX ——? Spike three inches long; spikelets ten in number, the two lowest compound and about an inch asunder, the remaining eight regularly decreasing in distance: lower bractea with a narrow ligula passing round the stem: leaves flat, about one-eighth of an inch in breadth, sheathing the stem at their base: stem eighteen inches high, with three rough angles: perigynium ovate, acuminate, serrulate nearly to the base, and very slightly bifid at the point: calyx-scales brown, with one strong nervure, more or less discontinued below the point, which has broadly membranaceous edges. The specimen is from Crichton castle, near Edinburgh, one of the stations given by Sir Wm. Hooker for C. axillaris. I have other specimens of the same plant from Borthwick castle, near Edinburgh, gathered by Mr. Ainley of Bingley; and others from the same locality. I have also two fine specimens of this plant, which were given to me in 1834, without any name, but marked "Putney, near London;" this also is one of the stations given for C. axillaris. Perhaps many of the stations that are given for C. axillaris would turn out to belong to this plant, if carefully examined. The true C. axillaris I have from the Edinburgh Botanic Garden, and from Southampton, and others from Over in Cheshire.—*Id.*

394. *Note on Carex muricata.* The last Carex I shall notice at

present is C. muricata, as we have two very different plants passing under this name. One of them grows in bogs and other like places, and has a fruit like Mr. Leighton's figure, marked Pentland hills; the other form grows on dry ground, and is a much more slender plant, with narrower leaves, and a fruit more like Leighton's fig. β. As these two forms do not well agree, it would perhaps be more convenient to separate them, the smaller form being the same as the Carex Hookeriana of the American botanists. I think this step the more advisable, as this form will just stand between the larger or *true* muricata and divulsa. The first or larger form grows at Weston bog, near Otley, and many other places in Yorkshire. The second or smaller form I have from Reigate, given to me by Mr. Luxford; and from Bingley, by Mr. Ainley. I have other specimens from Scotland and many of the English counties; my American specimens are from Mr. Nuttal. Much might be said on the nomenclature of some others of our Carices, such as the distans of Withering, which is the speirostachya of Smith, and now the fulva of Hooker and others.—*Id.*

395. *Birch Wine.* I have often drank a beautiful wine in this neighbourhood, sparkling like champagne, which is made without sugar, water or spirit, being merely the sap of the birch-tree, boiled with honey and fermented with a little yeast. The birch grows abundantly about Bucklebury near here, so that on the advance of spring these trees are tapped, and a hollow tube inserted into the hole, through which the sparkling sap flows drop by drop into a vessel placed below. Fine weather is, of course, best for this operation. — *William Hewett*; *East Ilsley, Berks.*

396. *Localities of a few Plants lately observed.*

GLAMORGANSHIRE, (in addition to Mr. Gutch's List, Phytol. 104, &c.)

Lepidium latifolium. Near Neath.
Brassica oleracea. Cliffs near Dunraven.
Erodium maritimum. Near Swansea.
Œnothera biennis. Near Neath.
Spergula nodosa. Near Pennard castle.
Campanula glomerata. Near Dunraven.
Borago officinalis, (with white flowers). Near St. Donat's.
Statice Limonium. Near Neath.
Marrubium vulgare. Near Port Eynon.
Orobanche barbata. Oystermouth castle ruins.
Ruscus aculeatus. Shore of Oxwich bay, near Pennard castle.
Rumex Hydrolapathum. Cromlyn bog.
Atriplex littoralis. Swansea.
Schœnus nigricans. Cromlyn bog.
Scirpus maritimus. About Neath.
Eriophorum polystachion. Cromlyn bog.
Carex extensa. Near Neath.
Poa maritima. Ditto.
Triticum junceum. Ditto, and Cromlyn burrows.

Cnicus tuberosus. Between St. Donat's & Dunraven. I have not heard of any recorded habitat for this plant, except the Wiltshire one; and should like to know if it has been found anywhere else in England or Wales.

RADNORSHIRE.

NEAR CLYRO.

Circæa alpina
Myosotis repens
Eriophorum pubescens
Paris quadrifolia
Campanula latifolia
Hypericum dubium
Hypericum Androsæmum
pulchrum, &c.
Mentha sylvestris

RHOS GOCH, NEAR CLYRO.

Narthecium ossifragum
Menyanthes trifoliata
Comarum palustre
Veronica scutellata
Littorella lacustris
Genista anglica
Sison inundatum
Orchis latifolia
Eriophorum polystachion
angustifolium
vaginatum

Meconopsis cambrica. Craig Pwll Dhu.

Viola lutea. Hills near ditto.

Trollius europæus and *Epipactis latifolia.* Near ditto.

Mœnchia erecta. Hills near ditto.

Sedum Forsterianum and *Saxifraga hypnoides.* Near Water-break-its-neck.

Epilobium palustre, *Ranunculus Lingua*, *Littorella lacustris* and *Nymphæa alba.* Llanbychllyn pool, near Craig Pwll Dhu.

Sedum anglicum. Rocks near ditto.

Lemania fluviatilis & *torulosa.* On stones in the stream at Water-break-its-neck and Craig Pwll Dhu.

BRECKNOCKSHIRE.

Cerasus Padus. Hedges about Chapel y Fin and Llanthony.

Saxifraga hypnoides and *Vaccinium Vitis-Idæa.* Black mountains.

Cnicus pratensis, *Hieracium umbellatum* and *Narthecium ossifragum.* Near Ystrad Felltre.

Gnaphalium dioicum. Near the Cil hepste falls.

———— *Margaritaceum.* Near Pont Nedd Fychan.

Habenaria viridis. Ditto.

Geum rivale. Falls of the Mellte.

HEREFORDSHIRE.

Hesperis matronalis. Banks of the Lug, near Aymestree.

Melica nutans. Wynd cliff, near Chepstow.

—*T. Westcombe; Worcester, October*, 1843.

397. *List of Mosses found near Castle-Howard, Yorkshire.* I send for insertion in your valuable journal, a catalogue of mosses found within three miles of Castle-Howard. To be more explicit, however, with regard to the boundaries of the district, I may state that I have confined my observations entirely to those species found on the Earl of Carlisle's estate, the extreme points of which rarely extend beyond the distance specified above. The same remarks will apply to my list of flowering plants (Phytol. 577), where I omitted to mention this important circumstance. The list annexed below is the result of several years' careful investigation, and I think will not only be considered an interesting but a comprehensive one, in proportion to other districts of similar extent. The extensive woods, many varieties of soil, &c. may however, with some degree of probability, be taken into consideration, as circumstances favourable for the growth of this order

of plants. I have affixed a cipher to those species which I have not yet detected in a state of fructification.

Anomodon curtipendulum
viticulosum
Bartramia arcuata
fontana
Bryum affine
albicans 0
argenteum
cæspititium
capillare
carneum
hornum
ligulatum
marginatum
nutans
palustre
punctatum
roseum 0
rostratum
squarrosum 0
ventricosum
Daltonia heteromalla
Dicranum adiantoides
bryoides
cerviculatum
flexuosum
glaucum 0
heteromallum
scoparium
taxifolium
varium
Didymodon flexicaulis 0
heteromallus
purpureus
rigidulus
Encalypta streptocarpa 0
vulgaris
Fontinalis antepyretica 0
Fumaria hygrometrica
Grimmia apocarpa
pulvinata
Gymnostomum fasciculare
ovatum
pyriforme
truncatulum
viridissimum
Hookeria lucens
Hypnum aduncum
albicans 0
alopecurum
Blandovii
brevirostre
commutatum
complanatum
confertum
cordifolium 0
crassinervium
cupressiforme
curvatum
cuspidatum
dendroides
denticulatum
filicinum
fluitans 0
loreum
lutescens
medium
molluscum
multiflorum
murale
myosuroides
nitens
palustre
piliferum
polymorphum 0
populeum
prælongum
proliferum
purum
ruscifolium
rutabulum
salebrosum 0
Schreberi 0
scorpioides 0
sericeum
serpens
splendens
squarrosum
stellatum
stramineum
striatum
tenellum
trichomanoides
Hypnum triquetrum
undulatum
velutinum
Leucodon sciuroides 0
Neckera crispa 0
pumila
Orthotrichum affine
anomalum
crispum
cupulatum
diaphanum
pulchellum
striatum
Phascum bryoides
cuspidatum
subulatum
Polytrichum aloides
commune
juniperinum
nanum
piliferum
undulatum
urnigerum
Sphagnum acutifolium
cuspidatum 0
obtusifolium
squarrosum
Splachnum ampullaceum
Tetraphis pellucida
Tortula convoluta
fallax
muralis
rigida
ruralis
subulata
tortuosa 0
unguiculata
Trichostomum lanuginosum
Weissia cirrata
controversa
curvirostra
lanceolata
recurvata
trichodes
verticillata

—*H. Ibbotson: Ganthorpe, near Whitwell, Yorkshire, Oct.* 20, 1843.

398. ***Note on the Second Flowering of a Horsechesnut Tree.*** There is a fine horsechesnut tree standing in a garden at the corner of the Lyndhurst road, in Peckham. This tree is remarkable for a propensity to blossom early in the spring; it is invariably the earliest in the neighbourhood, both as regards leaves and flowers, and is an object of admiration to our residents, as well as to the gentle race of citizens who disport themselves in our atmosphere on Sundays. This year its leafy and flowery honours were nipped by an untimely frost; they became brown and shrivelled, and the tree remained throughout the summer months a most unsightly object, while its more prudent neighbours were quite uninjured. In September new buds made their appearance, sent forth new leaves, and new spikes of beautiful flowers. On the 1st of October the tree was clothed in a robe of bloom, and since then I have daily walked through the fallen flowers which strew the footway beneath its branches.—*Edward Newman: Hanover St., Peckham, October* 25, 1843.

ART. CLXXIX.—*Proceedings of Societies.*

BOTANICAL SOCIETY OF LONDON.

October 6, 1843.—John Reynolds, Esq., Treasurer, in the chair.

Donations to the library were announced from Dr. Goodfellow, Messrs. Quekett, Woodward, and Rich, and the Microscopical Society. British Plants had been received from the President and Miss M. Beever, and a very large collection of East-Indian Plants, many of them collected by Dr. Wight, were presented by the Royal Horticultural Society of Cornwall.

Mr. Adam Gerard exhibited a collection of Fruits and Seeds from Sierra Leone, containing specimens of the fruits of the butter and tallow tree (*Pentadesma butyracea*).

Read, "Notes of a Botanical Excursion to Tilgate Forest in August last," by John Reynolds, Esq., Treasurer.—*G. E. D.*

MICROSCOPICAL SOCIETY OF LONDON.

October 18, 1843.—J. S. Bowerbank, Esq., F.R.S., in the chair.

Read, a paper by Edwin J. Quekett, Esq., on "An Instance of Monstrosity in a Moss." After some observations on the well-known fact that the several organs which constitute the flower and fruit of a plant are only modifications of leaves, and also on the formation of double flowers by the conversion of the parts of reproduction into petals, Mr. Quekett stated that although instances of these changes were extremely common in *flowering* plants, they are but rarely met with among those which are *flowerless;* still, however, they do occur sufficiently often in the latter, to prove that the same law which operates in the former instances, obtains also in some of the higher orders of flowerless plants, as in the case of certain ferns, in which minute leaves occasionally occupy the position of the sorus, or part appropriated to the organs of reproduction. Professor Lindley, in speaking of the mosses, suggests that the calyptra, the operculum, and peristomium may be nothing more than modifications of leaves; and that even the theca itself may also be the distended apex of the stem. No specimens of mosses, however, illustrating this identity of the organs of reproduction with those of nutrition, appear to have been observed, until Mr. Quekett discovered some which go far to prove that these minute organs are capable, under certain circumstances, of being converted into leaves, thus leaving but little doubt that modifications of leaves are here employed as in ferns and in the higher orders of plants, to constitute the parts concerned in the duty of reproduction.

The specimens were produced in the following manner. Having placed some mosses, with the fructification in different stages of development, in one of the close-glazed cases introduced by Mr. Ward, the author found that one of them (*Tortula fallax*), which, when it was placed in the box, exhibited every tendency to produce fruit, after a time lost every appearance of fruit advancing to maturation, a small tuft of leaves appearing in its place. Upon examining the plant under the microscope, it was evident that it was furnished with the usual leaves at the base. The seta existed of the usual brown colour, quite destitute of leaves; but in the place of the capsule, there was a continued elongation of the seta, of a green colour, bearing several leaves, which were also green, and varying in number from twelve to sixteen; and the author considers it probable, that the elements of the modified leaves, which otherwise would have formed the capsule and peristome, had been so influenced and changed by the heat and moisture of the situation in which they had been placed, as to bring them into a state fitted apparently for the purposes of nutrition only, and not of reproduction. This change he supposes to have been effected by the elongation of the columella, and the consequent carrying up of those leaves whose apices would, in the natural state, have formed the peristome. This variation from the ordinary structure of the parts of reproduction in a moss, appears, in his opinion, fully to bear out the observations of Professor Lindley before referred to, as to the identity of the calyptra, the operculum and the peristome with ordinary leaves: but it is not so clear that the theca is to be considered as the hollowed out apex of the stem. On the contrary, Mr. Quekett's opinion was, that it is formed by the united edges of the carpellary leaves; and he concluded by adducing some instances in other plants in corroboration of this supposition.

Mr. Varley exhibited and described a new form of microscope, which was said to possess all the contrivances found requisite for any instrument; and that many of the defects of other forms had been more or less obviated. The principal novelty in this microscope was a stage composed of one plate, being made to move on the surface of a fixed plate by means of a lever: this arrangement being admirably adapted to watch the movements of living creatures when submitted to magnifying powers. To effect this object, Mr. Varley had the moveable plate connected with the fixed one by guides furnished with ball and socket joints, which allowed it a perfect freedom of motion in all directions, of a smooth and uniform character. Considerable ingenuity was displayed in the several contrivances of this microscope, which was capable of having Mr. Varley's Graphic Telescope applied, for the drawing of objects in the field of the microscope.—*J. W.*